AMENDMENTS TO THE SPECIFICATION

Page 1, after the title insert the following:

This application is a division of Application No. 09/787,629, filed March 21, 2001, which in turn was the US national phase of international application PCT/FI99/00778 filed 22 September 1999, which designated the U.S., the entire content of which is hereby incorporated by reference in this application.

Please amend the paragraph beginning at page 4, line 21, as follows:

Further, US patent 5,034,128 deals with a similar kind of apparatus for raising the consistency to a range of 5 – 30 % from a low initial feeding consistency. In this case it is an apparatus, which is specially meant for removing liquid from fiber suspensions of the pulp industry, but the goal is a high increase in consistency and a high final consistency. A characteristic feature of the apparatus is that the screw is closed, i.e. the screw thread is fastened directly to a cylindrical or conical shaft core. The apparatus is further characterized in that the screw thread is arranged so close to the filter surface that it keeps the filter surface clean. In other words, the apparatus functions without a precoat layer. It is our conception, however, that the apparatus ~~can not~~ cannot function in the way described in the publication, but when pursuing high consistencies, the screw of the apparatus has to be used like a press.

Please amend the paragraph beginning at page 8, line 20 as follows:

Figure 2 illustrates an apparatus 10 according to one preferred embodiment of the invention. Said apparatus, or, when located in the application of Fig. 1, a pre-thickener, 10, comprises an essentially elongated outer casing 12, the first end of which is closed with an end plate 14 and to the first end of which an inlet conduit 18 for fiber suspension to be treated P_{in} is arranged. Said inlet conduit may be ~~coming~~ arranged to be connected to the apparatus either, as shown in the figure, ~~from beside~~ at the side of the apparatus or ~~from~~ at the end of the apparatus, in the axial direction. The inlet conduit may also be radial, tangential or a combination thereof. The other end of outer casing 12 is closed with an end plate 16 and to said other end there is arranged an outlet conduit 20 for thickened fiber suspension Pout being discharged from the apparatus. Just like the inlet conduit, the outlet conduit 20 may also be extending radially or tangentially ~~to beside~~ from the side of the apparatus or extending axially outwards from the end of the apparatus. The outer casing 12 is further provided with an outlet

conduit 26 for the filtrate Fout. Inside the outer casing 12, essentially at least between the inlet conduit 18 and the outlet conduit 20 there is a filter surface 22 arranged. The filter surface 22 preferably has a round cross-section. Bearings 28 are arranged at the end plates 14 and 16 of the apparatus 10 or in their vicinity, which bearings support a shaft 30. The shaft 30 is preferably driven by an electric motor, the rotational speed of which is either adjusted to be correct by means of a reduction gear or the rotational speed of which may be regulated by means of an inverter. At least one screw thread 32 is fixed on the shaft 30 so that the thread, according to a preferred embodiment, is positioned centrally inside the filter surface 22 and extends essentially throughout the whole length of the filter surface. In some cases, there may be several screw threads arranged inside each other. The screw thread 32 according to the invention is characterized in that it is positioned via tie rods at a distance from its shaft 30. There are valves 40 and 46 arranged in connection with both the outlet conduit 20 for the thickened pulp and the outlet conduit 26 for the filtrate in order to regulate the functioning of the apparatus.

Please amend the paragraph beginning at page 10, line 21 as follows:

According to a preferred embodiment of the invention, the inner surface of the filter member used in the apparatus is grooved essentially in the axial direction of the apparatus in order to make the thickened fiber mat collected onto to the filter surface to slide along the grooves directly to the discharge of the apparatus. This ensures that the fiber mat ~~can not~~ cannot cling to the screw and revolve together with it. Naturally, it is also possible to use other guiding means arranged essentially in the axial direction, such as e.g. ledges attached to the filter surface or the like. If the fiber mat would revolve with the screw, the latter would not push the thickened fiber layer to the discharge of the apparatus, but material going to the discharge would be practically non-thickened pulp only.

Please amend the paragraph beginning at page 11, line 1 as follows:

The apparatus 10 illustrated in Fig. 2 functions so that pulp Pin is fed pressurized into the apparatus from conduit 18, the pressure being usually 1 – 5 bar, preferably 1 – 3 bar. Thickened pulp Pout is discharged from the apparatus 10 through conduit 20 pressurized, the pressure being 0 – 4 bar, preferably 1 – 3 bar. In a typical application the feed consistency of the pulp is 2.5 %, i.e. 40 tons of water per one ton of pulp. In that case, the typical discharge consistency is 4 %, i.e. 25 tons of water per one ton of pulp. In other words, with a consistency increase of only 1.5 %, almost half of the liquid in the pulp has been removed and the actual

filter, wherein the pulp is taken, may be dimensioned for a much smaller water amount. Thus, a surprisingly small increase in the consistency (measured in per cents of consistency) solves problems related to big water amounts in the actual filter. The consistency of pulp being discharged from the apparatus is readily adjusted by changing the position of either the valve 40 for the thickened material or the filtrate valve 46 or both. Just closing the valve 40 for the thickened material increases the pressure inside the screen, whereby a bigger part of water in the suspension is removed into the filtrate. Opening the filtrate valve helps this process, resulting in a major increase in the consistency of the pulp. The removal of the filtrate may be further intensified by arranging a vacuum in the filtrate compartment ~~a vacuum~~, the natural result being an increase in the pressure difference prevailing over the filter surface.

Please amend the paragraph beginning at page 13, line 1 as follows:

The number of screw threads 32 (~~except for~~ instead of one thread, there may be two or more threads inside each other) and their pitch as well the rotational speed of the screw are selected so that the desired optimal mat formation, i.e. thickening is obtained for each type of pulp. Practice has shown that when using the apparatus used in our tests, the residence time of the fiber suspension in the apparatus should be less than five seconds, because after that no significant thickening occurred with the apparatus used in our tests. It is possible, though, ~~that~~ by significantly modifying the apparatus we used, ~~it is possible~~ to utilize even longer residence times. In that case, the constructional characteristics and/or the rotational speed of the screw are selected so that the feeding speed created by the screw (to put it more exactly, the lift speed, if the apparatus is vertical) is less than 3 m/s, preferably between 0.2 – 1.0 m/s and most preferably about 0.5 m/s. Nevertheless, this is not the actual pulp feed, because the screw does not feed the pulp totally through the apparatus, but only pushes the part of pulp thickened onto the filter surface to the discharge opening of the apparatus. Factors limiting said feeding speed are, e.g., the filtrating speed of the liquid off the fiber suspension and the generation of turbulence between the fiber mat and the filter surface.

Please amend the paragraph beginning at page 14, line 1 as follows:

The filtrate being removed from the apparatus may preferably be used for dilution in some other process stage. Especially preferably the filtrate is suited for dilution in the same process stage, i.e. the screening stage. In other words, the filtrate may be led for dilution either to the knotter, or the discharge tank for bottom dilution. Characteristically, the apparatus

according to the invention is not used in attempt of minimizing the fiber content of the filtrate, but the main goal is to maximize the efficiency and service reliability of thickening. Accordingly, the fiber content of the filtrate according to our tests is over 100 mg/l, mostly even in the order of 1000 mg/l. Nevertheless, this has no practical significance when the filtrate is returned to a preceding process stage. The fibers may be removed from the filtrate, ~~is~~ if so desired, with a separate fiber separator.

Please amend the paragraph beginning at page 15, line 15 as follows:

Another possible controlling method is e.g. an adjustment based on the power consumption of the drive motor. This controlling method is based on the fact that according to the tests we carried out, an increase in the consistency of the pulp results in an increase in the power requirement of the drive motor of the apparatus. Thus, e.g. in case of increased power requirement, it is possible to decrease the filtrate ~~input~~ flow by e.g. throttling the filtrate valve, which results in the initial consistency. And accordingly, in case of decreased power requirement, the filtrate discharge may be intensified by opening the filtrate valve.